

IN THE CLAIMS

Claims 1 -103 (Cancelled)

104. (Currently amended) The method of claim + 109 wherein searching for one or more additional signals comprises:

searching for multi-path components of the first signal.

105. (Currently Amended) The method of claim + 109 wherein searching for one or more additional signals comprises:

~~searching for multi-path components of the first signal~~ searching for a second signal from a third station.

106. (Currently Amended) The method of claim + 109 wherein searching for one or more additional signals comprises:

sweeping the one or more search beams across a region to search for the one or more additional signals.

107. (Currently Amended) The method of claim + 109 wherein forming multiple beam patterns comprises forming omni-directional tracking beams.

108. (Currently Amended) The method of claim + 109 wherein at least one search beam becomes the tracking beam after receiving the first signal from the second station.

109. (Previously Presented) A method of communication, comprising:

forming a multiple beam pattern comprising one or more tracking beams and one or more search beams wherein the formation of the tracking beams comprises receiving energy through a plurality of spatially separated elements, applying a weight to the received energy from each of the elements, and combining the weighted energy; and
maintaining a communication channel between a first station and a second station using the one or more tracking beams including receiving a first signal from the second

station while searching for one or more additional signals using the one or more search beams.

110 (Canceled)

111. (Currently Amended) The apparatus of claim ~~110~~ 115 wherein the antenna is further configured to search for multi-path components of the first signal.

112. (Currently Amended) The apparatus of claim ~~110~~ 115 wherein the antenna is further configured to search for a second signal from a third station.

113. (Currently Amended) The apparatus of claim ~~110~~ 115 wherein the antenna is configured to sweep the one or more search beams across a region to search for the one or more additional signals.

114. (Currently Amended) The apparatus of claim ~~110~~ 115 wherein the antenna is further configured to form omni-directional tracking beams.

115. (Previously Presented) An apparatus comprising:

an antenna configured to form multiple beam patterns comprising one or more tracking beams and one or more search beams, wherein the antenna is further configured to form the tracking beams by receiving energy through a plurality of spatially separated elements, applying a weight to the received energy from each of the elements, and combining the weighted energy; and

a processor configured to control the antenna to maintain a communication channel between a first station and a second station using the one or more tracking beams including receiving a first signal from the second station while searching for one or more additional signals using the one or more search beams.

116. (Previously Presented) An apparatus for communicating, comprising:

forming a tracking beam to cover a region, wherein the formation of the tracking beam comprises receiving energy through a plurality of spatially separated elements, applying a weight to the received energy from each of the elements, and combining the weighted energy;

receiving and tracking a signal in the region using at least one tracking beam;

forming a searching beam to received a detected signal, wherein the formation of the searching beam comprises receiving the energy through a second plurality of spatially separated elements, applying a second weight to the received energy from each of the second plurality of elements, wherein the second weight applied to the received energy from each of the second plurality of elements is different; and combining the second weighted energy, the second weight being a function of the weight applied to form the tracking beams;

tracking the signal by adjusting the second weight applied to the received energy from each of the second plurality of elements, wherein the tracking of the signal comprises moving the searching beam to a plurality of locations by adjusting the second weight applied to the received energy from each of the second plurality of elements, and fixing the searching beam in the location having the highest energy level.

117. (Previously Presented) An apparatus comprising:

an antenna configured to form multiple searching and tracking beams, wherein the antenna comprises a plurality of spatially separated elements, wherein the elements comprise first and second groups, the first group configured to form the tracking beams and the second group configured to form the searching beams;

a processor configured to control the antenna to track a signal with the tracking beam and to search for, receive and track a signal with the searching beam, wherein the processor further comprises a filter configured to apply a weight to energy received from the first group of elements, and combining the energy to form the tracking beam, the processor further comprising a searcher configured to search for the first signal as a function of the weighted energy, wherein the processor further comprises a second filter configured to apply a second energy weight to energy received from each of the second

group of elements, and combining the weighted second energy to form the second beam, the second weight applied to the energy received from each of the second group of elements being responsive to the searcher.

118. (Previously Presented) The apparatus of claim 117 wherein the second filter is further configured to apply a different second weight to the received energy from each of the second group of elements.

119. (Previously Presented) The apparatus of claim 117 wherein the processor further comprises a demodulator configured to demodulate the combined second weighted energy.

120. (Previously Presented) The apparatus of claim 117 wherein the second filter is further configured to adjust the second weight applied to the received energy from each of the second group of elements as a function of the demodulated combined second weighted energy.

Claims 121-123 (Canceled)